

ampère. In two hours and a half the hydrogen introduced into the gas would be about 70 c.c., sufficient, if retained, to reduce the weight by about 4 per cent. The fact that there was no sensible reduction proves that the hydrogen was effectively removed by the copper oxide.

The nitrogen, obtained altogether in four ways from chemical compounds, is materially lighter than the above, the difference amounting to about 11 mg., or about 1/200 part of the whole. It is also to be observed that the agreement of individual results is less close in the case of chemical nitrogen than of atmospheric nitrogen.

I have made some experiments to try whether the densities were influenced by exposing the gas to the silent electric discharge. A Siemens tube, as used for generating ozone, was inserted in the path of the gas after desiccation with phosphoric anhydride. The following were the results:—

Nitrogen from Air by Hot Iron, Electrified.

January 1, 1894 ...	2.31163	} Mean, 2.31059
January 4, 1894 ...	2.30956	

Nitrogen from N₂O by Hot Iron, Electrified.

January 2, 1894 ...	2.30074	} Mean, 2.30064
January 5, 1894 ...	2.30054	

The somewhat anomalous result of January 1 is partly explained by the failure to obtain a subsequent weighing of the globe empty, and there is no indication that any effect was produced by the electrification.

One more observation I will bring forward in conclusion. Nitrogen prepared from oxygen and ammonia, and about one-half per cent. lighter than ordinary atmospheric nitrogen, was stored in the globe for eight months. The globe was then connected to the apparatus, and the pressure was readjusted in the usual manner to the standard conditions. On reweighing no change was observed, so that the abnormally light nitrogen did not become dense by keeping.

DR. ARMSTRONG ON THE PUBLICATION OF SCIENTIFIC LITERATURE.

THE presidential address delivered by Dr. Armstrong at the last annual meeting of the Chemical Society, and published in the May number of the Society's *Journal*, contains numerous suggestive remarks on questions affecting all branches of science. A subject that has lately been attracting some attention is the publication of the proceedings of societies. On this Dr. Armstrong has much to say, and as he has had abundant opportunity of proving the value of the system followed by the Chemical Society, and comparing it with those of other societies, his opinions carry weight. Our space will not permit us to reprint the address, but the following extracts will suffice to show its character.

"Chemical literature is fast becoming unmanageable and uncontrollable from its very vastness. Not only is the number of papers increasing from year to year, but new journals are constantly being established. Something must be done in order to assist chemists to remain in touch with their subject and to retain their hold on the literature generally. This object would be best attained if chemists could agree to publish everything in one journal; but for many reasons, and until the world has recognised one language, such an idea must remain but a dream. This being the case, we must endeavour to have as few journals as possible, which is desirable even from the point of view of our pockets and of the dimensions of our book-shelves and houses, none of which are infinitely elastic. It is clear that in the British Isles but one journal is necessary; a large majority of the papers by workers in British laboratories, containing matter new to chemical science, are at present communicated to us, and I see no reason why all should not be. I do not mean that all should be read before the Chemical Society, because the mere reading is frequently but a formal proceeding, or, in some cases, may take place with advantage elsewhere. The Society of Chemical Industry has set us a good example in this respect by publishing in one journal the papers read at various places in the country; it matters little that the papers are read before affiliated sections of the Society, as these sections are practically independent organisations. . . .

"It seems to me, that eventually one of two courses must

be adopted in this country—either the societies engaged in doing similar work must become affiliated, or our Society must return to the practice of early days and publish lengthy abstracts of papers communicated to societies such as the Royal Societies of London and Edinburgh, in order to bring these papers properly under the notice of chemists generally. The former course would involve an agreement amongst us to print in some uniform manner, less expensive, magnificent and stately than that adopted by the Royal Societies; a somewhat larger octavo than that of our present journal would probably suffice, such as is adopted for the *Annals of Botany*. If such an agreement were arrived at, a paper read and discussed before the Royal Society of London or Edinburgh, for example, might be printed off, and the necessary number of copies supplied to the society; while, if the paper interested chemists, we might at the same time take an appropriate number, and issue the paper as part of our Transactions. . . .

"The policy thus advocated with reference to English chemical papers is already being elsewhere adopted: The *Monatshefte für Chemie*, for example, is advisedly a collection of the papers of Austrian chemists, although, unfortunately, this does not yet include the whole of the work done in Austria-Hungary. The *Gazzetta chimica italiana* appears to contain very nearly all the Italian work. All that is done in Holland is brought together in the *Recueil des travaux chimiques des Pays-Bas*. France and Germany, however, each have a variety of journals. In France the prestige of the Academy is such that for some time to come it will probably be difficult to consolidate the interests of French chemists. In Germany, however, the *Deutsche chemische Gesellschaft* is no longer hampered by the words *zu Berlin*, which it has boldly dropped, while we still remain the Chemical Society of London in name; it is to be hoped that in the interests of the scientific world it will ere long acquire and quash the private interests by which other journals are supported. I see no good reason even why journals devoted to special branches of our subject should exist, and I regard the appearance, for example, of a special journal of inorganic chemistry as an unmitigated evil. Political colouring and a tendency to adopt methods akin to those of the newspaper editor, of which we have had evidence in one of these journals, are most undesirable features in science. Moreover, we cannot afford to buy everything; and no effort should be spared to prevent our being split up into factions and becoming narrow-minded specialists: the more the student of chemistry—and every original worker must be and remain a student throughout his life—is brought directly into contact with the work which is being done in the several departments of his science, the better it will be for him; he cannot and need not read everything, but do not let us deprive him of the opportunity of easily indulging in a mixed diet, and of exercising his mental faculties generally, while devoting himself specially to some one section of the vast subject which it is the privilege of the chemist to command.

"To complete my scheme—which I trust is not altogether visionary, for so great is the toleration and sympathy between all true-minded scientific workers that if union be possible in any field of human activity it is possible in the field of science—it will be necessary that the Scandinavian and Danish chemists, say, should unite; and also that the Russian chemists should give us a '*recueil des travaux chimiques*' in French, so that the world may no longer be deprived of the knowledge of their labours, which we know, from experience, are of high value. As to America, it would be a great achievement if the political separation of our two nations could be disregarded and we were to unite with our cousins in establishing one journal for the publication of the work of chemists speaking English. There would be no real difficulty in doing this in these days of type-written manuscript, the proof of which need but be revised by the printers' reader. But if motives of expediency render such union impracticable, then it is to be hoped that steps may be taken to make the title *American Chemical Journal* truly and completely significant. I hope that we shall be successful in arranging to co-operate with all chemists in our own colonies and India. . . .

"There has been much discussion during the past few months, especially in the columns of NATURE, on the question of the publication of physical papers, which, strange to say, is in a very inchoate condition. I feel sure that the problem will soon be successfully solved by the Physical Society boldly coming forward and undertaking to do for physics what we have proved can be done for chemistry; there is no other solution possible,

and the needs of physics are so great that no time should be lost. We, in this Society, can never be too grateful to Professor Williamson for having led the storming party to victory which established our system of abstracts; he foresaw that when such a scheme was successfully launched it was bound to become self-supporting, and such has long since proved to be the case. Let us hope that the physicists have at their disposal some one equally bold and far-sighted, who will overcome the fears of the timid, and initiate a thoroughly comprehensive scheme. Chemists are directly interested in the work, as we are bound to take notice of the progress of physics, and the want of an English record is much felt by us. We had no society with cognate aims to help us, so that the physicists are in a far stronger position than we were, as the Institution of Electrical Engineers should be prepared to forward such a cause. I believe it will be found to be of the utmost importance to them to do so. Indeed, the electrical engineer of the present day, I fear, is fast becoming a specialist of the deepest dye: having had experience of several hundreds, I know that when a student he is most difficult to deal with, as he will only pay attention, even in physics, to what he believes to be of immediate importance to him; as to chemistry, he will scarce notice it, forgetting, or not realising, that the whole field of electro-chemistry is yet untilled. It is, therefore, very necessary that no effort should be spared to make the electrical engineer better informed regarding physics generally. . . .

"The Royal Society of London has recently issued to the scientific world a circular having reference to the preparation of complete catalogues of science by *international co-operation*, which raises questions of such importance that I do not hesitate to reproduce it.

"Sir,—The Royal Society of London, as you are probably aware, has published nine quarto volumes of *The Catalogue of Scientific Papers*, the first volume of the decade—1874–83—having been issued last year.

"This catalogue is limited to *periodical* scientific literature, *i.e.* to papers published in the transactions, &c., of societies, and in journals; it takes no account whatever of monographs and independent books, however important. The titles, moreover, are arranged solely according to author's names; and though the Society has long had under consideration the preparation of—and is hoped may eventually issue as—a key to the volumes already published, a list in which the titles are arranged according to subject-matter, the catalogue is still being prepared according to author's names. Further, though the Society has endeavoured to include the titles of all the scientific papers published in periodicals of acknowledged standing, the catalogue is—even as regards periodical literature—confessedly incomplete, owing to the omission of the titles of papers published in periodicals of little importance or not easy of access.

"Owing to the great development of scientific literature the task of the Society in continuing the catalogue, even in its present form, is rapidly increasing in difficulty. At the same time it is clear that the progress of science would be greatly helped by—indeed, almost demands—the compilation of a catalogue which should aim at completeness, and should contain the titles of scientific publications, whether appearing in periodicals or independently. In such a catalogue the title should be arranged not only according to authors' names, but also according to subject-matter, the text of each paper and not the title only being consulted for the latter purpose. And the value of the catalogue would be greatly enhanced by a rapid periodical issue, and by publication in such a form that the portion which pertains to any particular branch of science might be obtained separately.

"It is needless to say that the preparation and publication of such a complete catalogue is far beyond the power and means of any single society.

"Led by the above considerations, the President and Council of the Royal Society have appointed a committee to inquire into and report upon the *feasibility of such a catalogue being compiled through international co-operation*.

"The Committee are not as yet in a position to formulate any distinct plan by which such international co-operation might be brought about; but it may be useful, even at the outset, to make the following preliminary suggestions:—

"The catalogue should commence with papers published on or after January 1, 1900.

"A central office, or bureau, should be established in some place, to be hereafter chosen, and should be maintained by

international contributions—either directly, that is, by annual or other subsidies—or indirectly, that is, by the guarantee to purchase a certain number of copies of the catalogue.

"This office should be regularly supplied with all the information necessary for the construction of the catalogue. This might be done either by all periodicals, monographs, &c., being sent direct to the office to be catalogued there, or by various institutions undertaking to send in portions of the catalogue already prepared, or by both methods combined.

"At such an office, arrangements might be made by which, in addition to preparing the catalogue, scientific data might be tabulated as they came to hand in the papers supplied.

"The first step, however, is to ascertain whether any scheme of international co-operation is feasible and desirable. The Committee, accordingly, is desirous of learning the views upon this subject of scientific bodies and of scientific men.

"We, therefore, venture to express the hope that you will be so good as, at some early opportunity, to make known to us, for the use of the Committee, your own views on the matter.

"Should the decision you report be in any way favourable to the scheme, may we further ask you to communicate to us, for the use of the Committee, any suggestions which you may think it desirable to make, as to the best methods of inaugurating such a scheme, as to the constitution and means of maintenance of the Central Office, as to the exact character of the work to be carried on there, as to the language or languages in which the catalogue should be published, and the like?

"We are,

"Your obedient servants,

"M. FOSTER, *Secretary R.S.*

"RAYLEIGH, *Secretary R.S.*

"J. LISTER, *Foreign Sec. R.S.*

"If any such scheme as is here foreshadowed could be carried out, it would obviously be of the greatest value to the world and productive of much saving, both of time and treasure. But the subject is full of difficulty, owing to the very numerous interests concerned. I trust, however, that when the time comes to deal with the chemical section—and, indeed, in the case of any future catalogue of chemical work, that we shall not be satisfied with a mere alphabetical arrangement, but that we shall classify the subject-matter alphabetically in sections, so as to lighten the labour of ascertaining the state of knowledge in any particular group. Already we do not know very many of the names recorded in our indexes, and, in the future, we shall be ignorant of a still larger proportion, unless our system of nomenclature be made so significant that each name will explain itself; and in the case of an alphabetical arrangement, substances belonging to the same group, having names with different initial letters, occur interspersed throughout the index: so that it is a matter of the greatest difficulty, if not impossible, by consulting such an index, to ascertain the references to all the members of the group. An alphabetical index also affords no indication of the extent to which knowledge of any particular group has increased during the interval covered by it; and, in fact, it only becomes of real use when provided with a key, such as Beilstein affords, in which the names of the known members of any particular group may be first looked up before consulting the alphabetical index. Also, in using a lengthy alphabetical index it is very easy to miss entries, and it is necessary to pay far more attention when consulting it than is the case when one of limited extent is used.

"I do not believe that there would be any real difficulty in arriving at a system of classification which, at all events, would limit a reference to comparatively few pages. We are told that by the Bertillon system, dealing with the card records of 90,000 convicts, it is possible—when the necessary measurements have been taken—to ascertain whether a prisoner has been before convicted, as it may be said, with considerable, if not absolute, confidence, that, in that case, his card will be found in a drawer containing only about 400. Surely, we ought to be able to devise a system which would equally limit our search."

THE WORK OF HERTZ.

Additions and Corrections to the Lecture reported last week, by
DR. OLIVER LODGE.

ON page 135, middle of first column, the word "clearly" ought to have been *probably*; for I am by no means clear that the gradual discharge of negative electrification from the